

WHAT IS CLAIMED IS:

1. An isolated polypeptide having
 - (a) an amino acid sequence set forth in SEQ ID NO: 4, or
 - (b) an amino acid sequence having a homology of at least 70% with the
- 5 amino acid sequence (a).
2. The polypeptide of Claim 1, which has an amino acid sequence set forth in
SEQ ID NO: 14.
- 10 3. An isolated polynucleotide having
 - (a) a nucleotide sequence encoding the polypeptide of Claim 1, or
 - (b) a nucleotide sequence complementary to the nucleotide sequence (a).
4. The polynucleotide of Claim 3, which has a nucleotide sequence set forth
- 15 in SEQ ID NO: 3 or SEQ ID NO: 15.
5. A recombinant vector comprising the polynucleotide of Claim 3.
6. The recombinant vector of Claim 5, which has a nucleotide sequence set
- 20 forth in SEQ ID NO: 3 or SEQ ID NO: 15.
7. A Cell comprising the recombinant vector of Claim 5.
8. A method for producing a plant sensitive to light signal transduction,
- 25 comprising the steps of:

(a) inserting a polynucleotide encoding the polypeptide of Claim 1 into an expression vector; and

(b) introducing the expression vector into a plant.

5 9. A transgenic plant produced by the method of Claim 8.

10. A plant tissue or seed derived from the plant of Claim 9.

11. A method for producing a dwarf plant, comprising the steps of:

10 (a) inserting a polynucleotide encoding the sequence of amino acids 1-138 of SEQ ID NO: 4 into an expression vector; and

(b) introducing the expression vector into a plant.

12. The method of Claim 11, wherein the plant exhibits at least one
15 phenotypic trait selected from the group consisting of shorter height, multiple shoots and floral shoot internodes, as compared to wild-type plant.

13. A transgenic plant produced by the method of Claim 11.

20 14. A plant tissue or seed derived from the transgenic plant of Claim 13.

15. The plant of Claim 9 or 13, wherein the plant is a dicotyledonous plant or a monocotyledonous plant.

25 16. A method of identifying a phytochrome signal transduction-associated

substance using the polypeptide of Claim 1 or a polynucleotide encoding the polypeptide.

17. A method of identifying a plant dwarfism-causing substance using a
5 polypeptide having the sequence of amino acids 1-138 of SEQ ID NO: 4 or a polynucleotide encoding the polypeptide.

18. The method of Claim 16 or 17, wherein the method is performed by at least one selected from the group consisting of cDNA library screening, BAC
10 (bacterial artificial chromosome) screening, DNA chips, protein chips, polymerase chain reaction (PCR), Northern blot, Southern blot, Western blot, enzyme-linked immunosorbent assay (ELISA), 2-D gel analysis, yeast 2-hybrid system, and *in vitro* binding assay.

15 19. A method for producing a protein having phosphatase activity, comprising the steps of:

- (a) inserting a polynucleotide encoding the polypeptide of Claim 1 into an expression vector;
- (b) introducing the expression vector into a cell;
- 20 (c) culturing the cell to express the polynucleotide; and
- (d) collecting the expressed protein from the cell culture.